

United States Patent: 6,787,643

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United States Patent

6,787,643

Dillon , et al.

September 7, 2004

Nucleotide sequence of Escherichia coli pathogenicity islands

Abstract

The present invention relates to novel genes located in two chromosomal regions within uropathogenic E. coli that are associated with virulence. These chromosomal regions are known as pathogenicity islands (PAIs). In particular, the present application discloses 142 sequenced fragments (contigs) of DNA from two pools of cosmids covering pathogenicity islands PAI IV and PAI V located on the chromosome of the uropathogenic Escherichia coli J96. Further disclosed are 351 predicted protein-coding open reading frames within the sequenced fragments.

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536/23.1; 435/252.3; 435/320.1; 435/325

Intern'l Class:

C07H 021/04; C12N 015/85; C12N 015/86; C12N 001/21;
C12N 015/63

Field of Search:

536/23.1 435/252.3,325,320.1

References Cited [Referenced By]

U.S. Patent Documents			
5814478	Sep., 1998	Valenzuela et al.	435/69.

Other References

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Podladchikova et al., "Nucleotide sequence and structural organization of *Yersinia pestis* insertion sequence IS100," FEMS Microbiology Letters, 121:269-274 (1994).

Attorney, Agent or Firm: Human Genome Sciences, Inc.

Government Interests

The United States has certain rights to this invention.

Parent Case Text

Claims

What is claimed is:

1. An isolated polynucleotide comprising the *nucleic acid* sequence of ORF ID 4 of Contig ID 65, consisting of nucleotides 2889-1915 at SEQ ID NO:65.
2. The isolated polynucleotide of claim 1, wherein said polynucleotide further comprises a heterologous polynucleotide sequence.
3. The isolated polynucleotide of claim 2, wherein said heterologous polynucleotide sequence encodes a heterologous polypeptide.
4. A method for making a recombinant vector comprising inserting the isolated polynucleotide of claim 1, into a vector.
5. A *nucleic acid* sequence fully complementary to the entirety of the nucleotide sequence of claim 1.
6. A recombinant vector comprising the isolated polynucleotide of claim 1.
7. The recombinant vector of claim 6, wherein said polynucleotide is covalently linked to a heterologous regulatory sequence that controls expression of the polypeptide encoded by ORF ID 4 of Contig ID 65.
8. A recombinant host cell comprising the isolated polynucleotide of claim 1.
9. The recombinant host cell of claim 8, wherein said polynucleotide is covalently linked to heterologous regulatory sequence that controls expression of the polypeptide encoded by ORF ID 4 of Contig ID 65.

Description

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates to novel genes located in two chromosomal regions within *E. coli* that are associated with virulence. These chromosomal regions are known as pathogenicity islands (PAIs).

2. Related Background Art

Escherichia coli (*E. coli*) is a normal inhabitant of the intestine of humans and various animals. Pathogenic *E. coli* strains are able to cause infections of the intestine (intestinal *E. coli* strains) and of other organs such as the urinary tract (uropathogenic *E. coli*) or the brain (extraintestinal *E. coli*). Intestinal pathogenic *E. coli* are a well established and leading cause of severe infantile diarrhea in the developing world. Additionally, cases of newborn meningitis and sepsis have been attributed to *E. coli* pathogens.

In contrast to non-pathogenic isolates, pathogenic *E. coli* produce pathogenicity factors which contribute to the ability of strains to cause infectious diseases (Muhldorfer, I. and Hacker, J., *Microb. Pathogen.* 16:171-181 1994). Adhesions facilitate binding of pathogenic bacteria to host tissues. Pathogenic *E. coli*